

## **Organic Debris Disposal**

### **Description**

For the purposes of this BMP, organic debris includes grass, leaves, pruned branches and any other vegetative material. This BMP discusses water quality concerns surrounding organic debris disposal methods.

Proper management of organic debris will likely become crucial as laws limiting the disposal of such waste in landfills go into effect. As of March 27, 1993, yard waste collected or generated in Michigan on public property is banned from landfills and incinerators.

### **Other Terms Used to Describe**

Composting  
Yard Waste Management

### **Pollutants Controlled and Impacts**

One significant impact of proper organic debris disposal is the reduction of organic debris in landfills. Since organic debris may contain pesticides and/or fertilizers, this may help reduce the amount of leachate that can impact groundwater.

Additional benefits include:

- compost and mulch contribute nutrients back into the soil. This reduces the amount of fertilizer needed.
- keeping compost piles and other organic debris out of surface waters and away from floodplains will help prevent the depletion of oxygen in surface waters. During decomposition, biological organisms deplete dissolved oxygen supplies in water.
- leaf composting prevents drains and sewers from clogging and reduces leaf burning by residents.
- increased organic material in soil results in improved water and nutrient holding capacity of the soil, better drainage, resistance to insects and diseases, easier cultivation, and better aeration.

### **Land Use**

Although this BMP applies to all land uses, it is particularly important in urban and urbanizing areas where available land is limited. This practice is also important on golf courses and other large recreational areas.

### Soil/Topography/Climate

Soils, topography and climate will all affect the types of organic debris disposal options available. These are discussed in more detail in the "Specifications" section, below.

### When to Apply

For newly developed areas, an organic debris management plan should be incorporated into the overall site plan. All areas which currently require the disposal of organic debris should evaluate ongoing disposal practices and modify them based on the contents of this BMP.

### Where to Apply

Apply in urban and urbanizing backyards, on golf courses, recreation areas and any other place where organic debris needs to be disposed of.

## **Relationships With Other BMPs**

The Lawn Maintenance BMP includes information on the proper mowing heights of the most common turfgrasses, and the basics of irrigating grass. It also briefly discusses concepts derived from the Pesticide Management and Fertilizer Management BMPs, and refers to this BMP for organic debris disposal specifications.

The end product of organic debris disposal may be of use in Soil Management.

Diversions may be needed to prevent excess stormwater from entering a composting area.

## **Specifications**

### **Grass Clippings:**

The Michigan State University publication "Turfgrass Pest Management: A Training Manual for Commercial Pesticide Applicators" (Extension Bulletin, E-2627) indicates that each year, degrading clippings provide 4 pounds of nitrogen, 1 pound of phosphorus and 2 pounds of potassium per 1,000 square feet. When clippings are regularly removed, fertilization must be increased by 25-50%. Grass clippings in plastic bags increase the cost of commercial composting efforts.

Clippings are routinely removed from high-maintenance areas to improve appearance and texture. Managers also routinely remove clippings with the belief that doing so prevents excessive thatch build-up. **Grass clippings do not cause thatch.** Wherever possible, leave grass clippings on lawns.

Mulching mowers can be used to chop grass clippings into smaller pieces. This will increase the rate in which the clippings are broken down. Use mulching mowers on lawns which are not overly wet and where the grass height has not been left too long between cuttings. The height of the grass should be somewhat higher than typical settings for bagging mowers: the lawn is best cut when the grass is one-third higher than the height of the blade. For example, if the grass is left at two inches following mowing, the grass would be cut when it reaches three inches.

Although lawns cut by mulching mowers must be cut more frequently (every 5-6 days as opposed to once per week), the time actually spent in the yard is less because there is no need to continually stop and empty the grass catcher. In addition, since grass clippings return nutrients to the soil, fewer fertilizer applications will be needed.

The only times clippings *should* be removed is when doing so will limit the inoculum of some diseases.

When clippings are removed, use proper composting procedures. Some of the basics of composting are discussed below.

### **Leaves:**

Like grass, leaves can also be mulched. Mulched leaves left on the ground over the winter will not harm grass, because grass goes dormant in the Michigan climate. Winter puts leaves through a "freeze-thaw" cycle that helps soften them for decomposition. Winter snow and spring rains provide needed moisture for the subsequent breakdown.

Leaves can be gathered and placed in wooded areas for mulching, as long as the wooded area is not a forested wetland, surface water or in a floodplain. Spread the leaves evenly so that they can decompose properly. To aid decomposition, moisten each layer lightly. If possible, spread leaves over the garden, in flower beds and wherever there is open soil.

Leaf mulching can be assisted by chopping, shredding, or mowing the leaves before using them as mulch. Make sure the machine selected for this is rated to handle leaves.

If it is not practical to mulch leaves, follow proper composting procedures, some of which are summarized below.

### **Tree Branches, Limbs, etc.**

Ideally, tree branches should be chipped and the chipped material used in landscaping. The use of wood chips as mulch is discussed in the Mulching BMP.

Inclusion of brush and tree trimmings in a composting program will require a chipper or other device such as a tub grinder to reduce particle size and volume. Co-mingling brush with leaves and grass clippings is not advised prior to chipping, because leaves and grass clog chippers and brush will clog shredders and screens. Because brush breaks down more slowly than leaves and grass, chipped brush should not exceed 10% of the volume of materials being composted. Some people add wood chips to compost to increase aeration of the pile.

### **Composting:**

Composting is the biological decomposition of organic matter. The micro-organisms which break down organic matter need food, air and water. Food is the organic waste. Air is provided by mixing and aerating. Water comes from rainfall and the garden hose. With the proper balance of food, air and water, coupled with sufficient volume to hold heat, micro-organisms will thrive and generate heat to initiate and sustain the composting reaction. The finished product--called compost or humus--can be a valuable mulch or soil conditioner if proper care is taken to avoid contaminants and if aerobic conditions are maintained during composting. See "Land Application," below.

The following is provided as a summary of the water quality concerns surrounding composting operations. Most of the information was extracted from two publications, both of which are available from the Michigan Department of Natural Resources, Waste Management Division. These publications are: "Mulching and Backyard Composting Guidebook," and "Yard Waste Composting Guidebook for Michigan Communities."

The Type of Composting System:

The type of composting system required will vary depending on the amount of material expected. For backyard operations, small bins or a series of bins will work. For larger operations, organic debris should be put into several piles.

Land Application of Compost:

Compost is considered a soil amendment, not a fertilizer. Compost can be added into the soil to provide more organic matter, but only after the compost is cured. A cured compost is free from objectionable odors, has little oxygen demand, is dark and crumbles in the hand. Compost can also be spread around shrubs, trees or in the garden in 1-3 inch layers as concentrated **mulch**.

Direct land application of organic matter should not exceed 40 tons per acre, which would be approximately 400 cubic yards of yard waste at a density of 200 pounds per cubic yard spread to a 3-inch depth. Debris can be applied via a manure spreader or other methods, and can be incorporated into the soil 4-12 inches using a chisel plow or rototiller. Shredding leaves during collection makes soil incorporation easier and spreading rates more uniform. One of the best times to rototill compost is before seeding or sodding a new lawn.

Composting in Windrows (Rows of Piles):

As a rule of thumb, 3,500 to 5,000 lightly compacted cubic yards of incoming leaves requires about one acre of land. For bigger quantities of waste, or where large amounts of land are not available for direct land application, push thick layers of leaves into windrows. Windrows can be anywhere from 3-10 feet high and up to 18 feet wide. Leave space between windrows to allow air to circulate amongst the piles, and to allow access by equipment. Water lightly between layers. Mix and reform the windrow one or more times per year.

Decomposition time of large piles which sit on the ground and are mixed only once per year will not likely result in compost for several years. To increase decomposition time, more frequent mixing should be done, and watering should be done to prevent the piles from getting too dry. By increasing the rate of decomposition, yard waste can be stabilized in as little as 3-6 months. Follow all mixing, watering and aerating procedures in the guidebooks listed above.

Location of Composting Piles:

Soil type will help dictate the proper location of the bins or windrows. Natural soils should have a high enough percolation rate to move water away quickly so that standing ponds of water don't form.

In bigger operations, the need for the soil to provide sufficient stability for heavy equipment must be balanced by the ability of the surface to drain off excessive rainwater.

To lessen the chances of ponding water, do not locate organic debris piles in areas with high water tables. Also avoid steep slopes. Soil surveys providing information on soil types, percolation rates, and depth to ground water are available for most counties in the local Soil Conservation District offices.

Never locate composting piles in wetlands or other surface waters, or in floodplains.

To reduce potential odor problems, the Department recommends a minimum 500-foot buffer zone between large, active compost operations and residences, with a 50-foot setback from compost windrow edges. Curing piles can be placed so as to create a berm around the perimeter of the site to serve as a visual and sound barrier.

The ideal composting site for most homes is a clear area, away from trees and landscaping. An area somewhere between 6' x 6' and 12' x 9' will suffice. Avoid tight and cramped corner spots. Provide plenty of room to access the working area with a pitchfork from all directions.

The Processes Involved in Composting:

It is beyond the scope of this BMP to discuss all the principles of composting. Composting requires proper aeration, watering and mixing in order to result in a useable end-product. Refer to the guidebooks listed at the beginning of this section for additional information. Those guidebooks also discuss various types of machinery that can be used, frequency of mixing, various types of bins, and the biological processes involved in composting. The purpose of this BMP was to encourage users to incorporate organic debris disposal in their overall site management scheme, and to locate their mulching and composting operations in a manner which will not impact surface waters.

**Exhibits**

Exhibit 1: "Compost Bin Manufacturers." Mulching and Backyard Composting Guidebook. Michigan Department of Natural Resources, Waste Management Division.

## Exhibit 1

### Compost Bin Manufacturers

This partial list was derived through a review of resource recovery magazines, lawn and garden catalogs, vendors at the 1990 National Hardware Association Annual Hardware Show, and lawn and garden product distributors. Some of these firms may not sell directly to consumers. No recommendation is made for any model, style, or manufacturer. Check with your local hardware, department store, or lawn and garden retailer for availability in your area. Many gardening and specialty magazines and catalogs advertise compost bins, aerators, mixers, and inoculants that can be purchased through the mail.

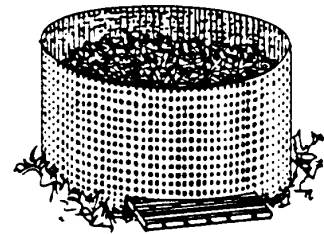
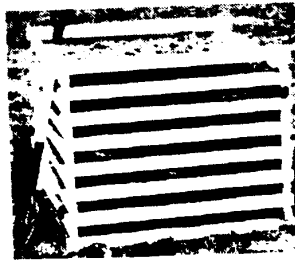
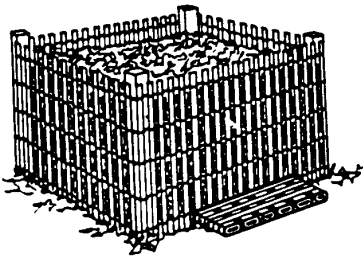
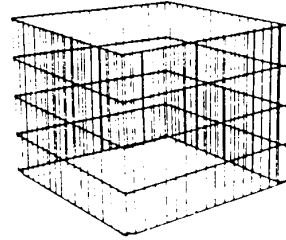
#### Wire Bins

Keystone Steel and Wire  
7000 SW Adams St.  
Peoria Illinois 61641

Spread All Manufacturing  
2237 Marshaltown Blvd.  
Marshaltown, IA 50158  
800-383-5601

Vision Sales Inc.  
Bartlett, Il. 60103  
708-837-2967

Southwestern Products, Inc.  
PO Box 421  
Joplin, MO 64802  
800-624-3800



#### Cedar Bins

Evergreen Bins  
PO Box 70307  
Seattle, WA 98107  
206-783-7095

The Natursoil Company  
1015 W. St. Germain, #400  
St. Cloud, MN 56301  
612-253-6153

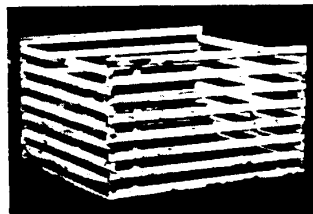
R.C. Sales  
Box 427  
Shaftsbury, VT 05262  
802-442-2071

#### Treated Wood Bins

K-D Wood Products  
PO Box 645  
Bingham, ME 04920  
207-672-4333

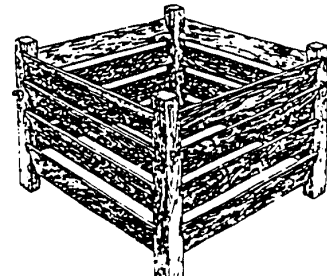
BioBin  
8407 Lightmoor Court  
Bainbridge Island, WA 98110  
206-842-6641

Zema Corporation  
PO Box 12803  
Research Triangle Park, NC 27709  
800-334-5530



Al-ko Kober  
25784 Borg Road  
Elkhart, IN 46514  
219-264-0631

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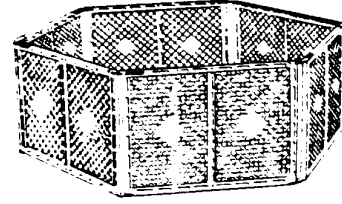


## Exhibit 1 (Con't)

### Compost Tumblers

Plant Right  
7201 Rawson Road  
Victor, NY 14564  
800-752-6802

Green Magic Tumbler  
Gardener's Supply  
128 Intervale Road  
Burlington, VT 05401  
800-548-4784



Kemp Compos-Tumbler  
160 Koser Road  
Lititz, PA 17543

### Plastic Bins

North States Industries  
1200 Mendelssohn Ave. Suite 210  
Minneapolis, MN 55427  
612-541-9101

Ringer  
9959 Valley View Road  
Eden Prairie, MN 55344  
612-941-4180

Brave Industries, Inc.  
115 E. Front Street  
Annawan, IL 61234  
800-627-1280

Plastigone Technologies  
10700 N. Kendall Drive  
Miami, FL 33176  
305-274-8497

Kompost Industries Inc.  
1640 Superior Avenue  
Costa Mesa, CA 92627  
714-548-8531

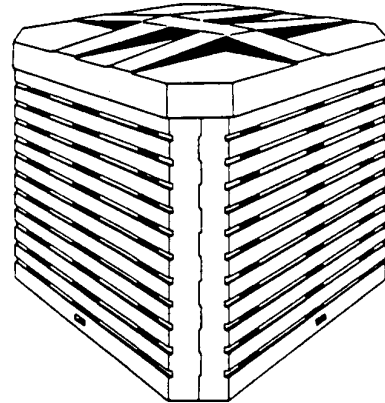
Bio Industries, Inc.  
450 S. Lombard Rd.  
Addison, IL 60101  
708-953-9040

Compost Systems  
16 Hillview  
Barrington, IL 60010  
800-848-3829

Barclay Recycling, Inc.  
75 Ingraham Rd.  
Toronto, Ontario M6M 2M2  
416-240-8227

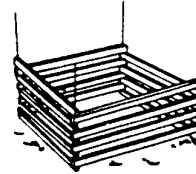
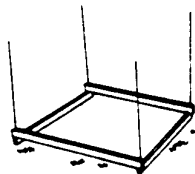
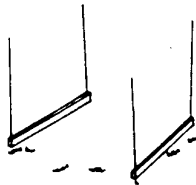
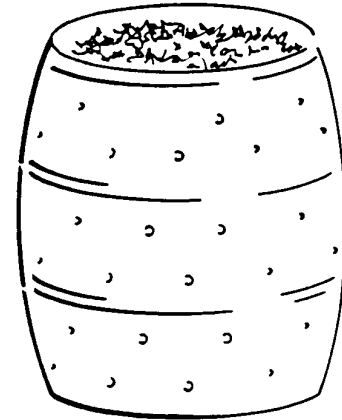
Shape Plastics  
PO Box 1037  
Crystal Lake, IL 60012  
815-455-6310

Solar Cone, Inc.  
Box 67  
Seward, IL 61077  
815-247-8454



A Plastic 55 gallon drum can be turned into an effective compost bin in a few simple steps. Merely cut off the top and bottom of the barrel with a sabre saw and cut a series of 2" to 3" holes in the sides for aeration.

A lid can be formed by cutting off the top of the barrel 6" to 10" down along the side. The barrel is then inverted and the lid placed over what was the bottom of the drum. For more information on barrel and other composters, contact Wayne Koser through the Resource Recovery Section of the Waste Management Division at 517-373-4741.



Source: Mulching and Back Yard Composting Guidebook, Michigan Department of Natural Resources, Waste Management Division.